

Claims

- [c1] An automotive overhead airbag assembly comprising:
an airbag mounted on an inside surface of a vehicle roof
at an airbag mount position, said airbag having an airbag
stored condition and an airbag deployed position, said
airbag expanding downwards from said vehicle roof
when in said airbag deployed position;
at least one wing element having a upper wing mounting
edge mounted to said vehicle roof and a side wing
mounting edge mounted to a lower deployed portion of
said airbag, said upper wing mounting edge extending in
a transverse direction from said airbag mount position,
said at least one wing element having a wing stored con-
dition and a wing deployed position, said at least one
wing element restricting forward motion of said airbag
when said airbag is in said deployed position; and
a trampoline surface formed by said at least one wing el-
ement when said at least one wing element is in said
wing deployed position, said trampoline surface absorb-
ing passenger forward momentum during vehicle impact.
- [c2] An automotive overhead airbag assembly as described in
claim 1, wherein said at least one wing element com-

prises:

a first wing element extending in a first transverse direction from said airbag mount position; and

a second wing element extending in a second transverse direction from said airbag mount position.

[c3] An automotive overhead airbag assembly as described in claim 2, wherein said first wing element and said second wing element comprise triangular wing elements.

[c4] An automotive overhead airbag assembly as described in claim 1, further comprising:
an airbag module storing said airbag when said airbag is in said airbag stored position, said airbag module having at least one slotted guide positioned on a transverse side, said at least one slotted guide permitting said at least one wing element to extend in said transverse direction while said airbag is in said airbag stored position.

[c5] An automotive auxiliary restraint assembly as described in claim 1, further comprising:
a slotted chamber positioned on said vehicle roof, said slotted chamber extending in a transverse direction from said airbag module, said at least one wing element stored in said slotted chamber when said airbag is in said airbag stored position.

- [c6] An automotive auxiliary restraint assembly as described in claim 1, wherein said side wing mounting edge is vertically mounted to said airbag.
- [c7] An automotive auxiliary restraint assembly as described in claim 1, wherein said side wing mounting edge is stitched on an inner surface of said airbag.
- [c8] An automotive auxiliary restraint assembly as described in claim 2, wherein said airbag comprises a vertically orientated center portion, said first wing element and said second wing element mounted to opposing edges of said vertically orientated center portion such that said trampoline is comprised of said first wing element, said second wing element, and said vertically orientated center portion.
- [c9] An automotive auxiliary restraint assembly as described in claim 1, wherein said trampoline comprises said at least one wing element stretched to resist forward motion of said airbag.
- [c10] An automotive auxiliary restraint assembly as described in claim 1, wherein said airbag is mounted to a roof rail.
- [c11] An automotive overhead airbag assembly comprising:
an airbag mounted on an inside surface of a vehicle roof at an airbag mount position, said airbag having an airbag

stored condition and an airbag deployed position, said airbag expanding downwards from said vehicle roof when in said airbag deployed position;

a first wing element having a first upper wing mounting edge mounted to said vehicle roof and a first side wing mounting edge mounted to a lower deployed portion of said airbag, said first upper wing mounting edge extending in a first transverse direction from said airbag mount position, said first wing element having a first wing stored condition and a first wing deployed position;

a second wing element having a second upper wing mounting edge mounted to said vehicle roof and a second side wing mounting edge mounted to said lower deployed portion of said airbag, said second upper wing mounting edge extending in a second transverse direction from said airbag mount position, said second wing element having a second wing stored condition and a second wing deployed position;

said first wing element restricting forward motion of said airbag when said airbag is in said deployed position; and

a trampoline surface formed by said first wing element and said second wing element when said airbag is in said airbag deployed position, said trampoline surface restricting forward motion of said airbag, said trampoline surface absorbing passenger forward momentum during vehicle impact.

- [c12] An automotive overhead airbag assembly as described in claim 11, wherein said first wing element and said second wing element comprise triangular wing elements.
- [c13] An automotive overhead airbag assembly as described in claim 11, further comprising:
an airbag module housing said airbag when said airbag is in said airbag stored position, said airbag module having a first slotted guide and a second slotted guide positioned on opposing transverse sides of said airbag module, said first and second slotted guides permitting said first and second wing elements to extend in opposing transverse directions from said airbag module while said airbag is in said airbag stored position.
- [c14] An automotive auxiliary restraint assembly as described in claim 11, wherein said first wing element and said second wing element are stretched to resist forward motion of said airbag trampoline when said airbag is in said airbag deployed position.
- [c15] An automotive auxiliary restraint assembly as described in claim 11, wherein said first side wing mounting edge and said second side wing mounting edge are vertically mounted to said airbag.
- [c16] An automotive auxiliary restraint assembly as described

in claim 11, wherein said airbag is mounted to a roof rail.

[c17] A method of restraining passenger forward momentum during a vehicular impact comprising:
storing an airbag within an airbag module, said airbag module positioned on a vehicle roof, said airbag having an airbag stored condition and an airbag deployed position;
deploying said airbag downwards into said airbag deployed position during the vehicular impact;
simultaneously deploying at least one wing element having a upper wing mounting edge mounted to said vehicle roof and a side wing mounting edge mounted to a lower deployed portion of said airbag, said upper wing mounting edge extending in a transverse direction from said airbag mount position, said at least one wing element restricting forward motion of said airbag when said airbag is in said deployed position;
engaging the passenger using a trampoline surface formed by said at least one wing element when said airbag is in said airbag deployed position, said trampoline surface absorbing passenger forward momentum during vehicle impact.

[c18] A method as described in claim 17, further comprising:
storing said at least one wing element a slotted chamber

positioned on said vehicle roof, said slotted chamber extending in a transverse direction from said airbag module, said at least one wing element stored in said slotted chamber when said airbag is in said airbag stored position; and

routing said at least one wing element through at least one slotted guide positioned on a transverse side of said airbag module, said at least one slotted guide permitting said at least one wing element to extend in said transverse direction while said airbag is in said airbag stored position.

[c19] A method as described in claim 17, wherein said at least one wing element comprises a first wing element and a second wing element, further comprising:

folding a vertically orientated right portion and a vertically orientated left portion of said airbag over a vertically orientated center portion;

positioning said airbag within said airbag module such that said first wing element extends in a first transverse direction outwards from said airbag module through a first slotted chamber and said second wing element extends in a second transverse direction outwards from said airbag module through a second slotted chamber.

[c20] A method as described in claim 19, further comprising: exerting tension in said at least one wing element by de-

ploying said airbag; and
generating an extended passenger engagement surface
comprising said at least one wing element and said
airbag when said airbag is in said airbag deployed posi-
tion.